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Claims:

1.   A load distribution device provided in each of nodes included in a network, comprising:

a link state memory retrievably storing link state information of the network, wherein the link state database is
5   used to dynamically calculate an alternate route for failure recovery when a failure notification is received;

a route candidate memory retrievably storing a plurality of route candidates for each of possible endpoint nodes; and
10   a route determiner for determining a route for a normally set up connection, wherein a route having a relatively small load is selected from a plurality of route candidates with a relatively high probability.

2.   The load distribution device according to claim 1,
15   wherein the route determiner comprises:

a route quality checker for checking quality of each of the route candidates by referring to the link state information stored in the link state memory when receiving a connection setup request; and
20   a route candidate selector for selecting the route for a requested connection from the route candidates depending on the quality of each of the route candidates.

3.   The load distribution device according to claim 2, wherein the route candidate selector selects a route candidate having a broadest available bandwidth as the route for a requested connection.

5   4.   The load distribution device according to claim 2, wherein the route candidate selector selects a route candidate as the route for a requested connection from the route candidates in a round robin fashion.

5.   The load distribution device according to claim 2,
10   wherein the route candidate selector selects a route candidate as the route for a requested connection from the route candidates in a weighted round robin fashion using an available bandwidth of each of the route candidates as a weight.

6.   The load distribution device according to claim 2,
15   wherein the route candidate selector selects a route candidate having a shortest delay time as the route for a requested connection among the route candidates satisfying a requested quality.

7.   The load distribution device according to claim 2,
20   wherein the route candidate selector selects a route candidate having a smallest fluctuation in data arrival interval as the

route for a requested connection among the route candidates
satisfying a requested quality.

8.   The load distribution device according to claim 2,
wherein the route candidate selector selects a route candidate

5   as the route for a requested connection from the route candidates
in a weighted round robin fashion using a reciprocal of delay
time for each of the route candidates as a weight.

9.   The load distribution device according to claim 2,
wherein the route candidate selector selects a route candidate

10   as the route for a requested connection from the route candidates
in a weighted round robin fashion using a reciprocal of
fluctuation in data arrival interval for each of the route
candidates as a weight.

10.   The load distribution device according to claim 2,
15   further comprising:

        an on-demand route calculator for calculating a
route satisfying a requested quality by referring to the link
state memory when no route candidate is found in the route
candidate selector.

20   11.   The load distribution device according to claim 1,
further comprising:

        an alternate route determiner for determining an

alternate route when a failure notification is received, wherein a route having a relatively small load is selected as the alternate route from a plurality of route candidates with a relatively high probability.

5   12.   The load distribution device according to claim 11, wherein the alternate route determiner comprises:

          a route quality checker for checking quality of each of the route candidates by referring to the link state information stored in the link state memory when receiving a

10   failure notification message; and

          a route candidate selector for selecting the alternate route for failure recovery from the route candidates depending on the quality of each of the route candidates.

          13.   The load distribution device according to claim 12,

15   wherein the route candidate selector selects a route candidate having a broadest available bandwidth as the alternate route for failure recovery.

          14.   The load distribution device according to claim 12, wherein the route candidate selector selects a route candidate

20   as the alternate route for failure recovery from the route candidates in a round robin fashion.

          15.   The load distribution device according to claim 12,

wherein the route candidate selector selects a route candidate as the alternate route for failure recovery from the route candidates in a weighted round robin fashion using an available bandwidth of each of the route candidates as a weight.

5   16.   The load distribution device according to claim 12, wherein the route candidate selector selects a route candidate having a shortest delay time as the alternate route for failure recovery among the route candidates satisfying a required quality.

10   17.   The load distribution device according to claim 12, wherein the route candidate selector selects a route candidate having a smallest fluctuation in data arrival interval as the alternate route for failure recovery among the route candidates satisfying a required quality.

15   18.   The load distribution device according to claim 12, wherein the route candidate selector selects a route candidate as the alternate route for failure recovery from the route candidates in a weighted round robin fashion using a reciprocal of delay time for each of the route candidates as a weight.

20   19.   The load distribution device according to claim 12, wherein the route candidate selector selects a route candidate as the alternate route for failure recovery from the route

candidates in a weighted round robin fashion using a reciprocal
of fluctuation in data arrival interval for each of the route
candidates as a weight.

      20.   The load distribution device according to claim 12,
5 further comprising:

      an on-demand route calculator for calculating an
alternate route satisfying a required quality by referring to
the link state memory when no route candidate is found in the
route candidate selector.

10   21.   A node in a network, comprising:

      a connection setup request receiver;

      a connection setup processor;

      a link state memory retrievably storing link state
information of the network, wherein the link state database is
15 used to dynamically calculate an alternate route for failure
recovery when a failure notification is received;

      a route candidate memory retrievably storing a
plurality of route candidates for each of possible
endpoint nodes; and

20   a route determiner for determining a route for
a normally set up connection to set up the requested connection,
wherein a route having a relatively small load is selected from
a plurality of route candidates with a relatively high
probability.

22.   The node according to claim 21, wherein the route determiner comprises:

a route quality checker for checking quality of each of the route candidates by referring to the link state

5   information stored in the link state memory when receiving a connection setup request; and

a route candidate selector for selecting the route for the requested connection from the route candidates depending on the quality of each of the route candidates.

10   23.   The node according to claim 21, further comprising:

an alternate route determiner for determining an alternate route when a failure notification is received, wherein a route having a relatively small load is selected as the alternate route from a plurality of route candidates with a

15   relatively high probability.

24.   The node according to claim 23, wherein the alternate route determiner comprises:

a route quality checker for checking quality of each of the route candidates by referring to the link state

20   information stored in the link state memory when receiving a failure notification message; and

a route candidate selector for selecting the alternate route for failure recovery from the route candidates

depending on the quality of each of the route candidates.

25.   The node according to claim 21, further comprising:

a link state memory controller for updating at least

the link state memory when one of a link state message and a

5   failure notification message is received.

26.   A load distribution method in each of nodes included

in a network, comprising the steps of:

a) retrievably storing link state information of

the network, wherein the link state database is used to

10   dynamically calculate an alternate route for failure recovery

when a failure notification is received;

b) retrievably storing a plurality of route

candidates for each of possible endpoint nodes; and

c) determining a route for a normally set up

15   connection, wherein a route having a relatively small load is

selected from a plurality of route candidates with a relatively

high probability.

27.   The load distribution method according to claim 26,

wherein the step (c) comprises the steps of:

20   checking quality of each of the route candidates by

referring to the link state information when receiving a

connection setup request; and

selecting the route for a requested connection from

the route candidates depending on the quality of each of the route candidates.

28.   The load distribution method according to claim 26, further comprising the step of:

5   d) determining an alternate route when a failure notification is received, wherein a route having a relatively small load is selected as the alternate route from a plurality of route candidates with a relatively high probability.

10   29.   The load distribution method according to claim 28, wherein the step (d) comprises the steps of:

checking quality of each of the route candidates by referring to the link state information when receiving a failure notification message; and

15   selecting the alternate route for failure recovery from the route candidates depending on the quality of each of the route candidates.

30.   A recording medium storing a computer program for performing a load distribution operation in each of nodes

20   included in a network, the computer program comprising the steps of:

a) retrievably storing link state information of the network, wherein the link state database is used to

dynamically calculate an alternate route for failure recovery when a failure notification is received;

b) retrievably storing a plurality of route candidates for each of possible endpoint nodes; and

5   c) determining a route for a normally set up connection, wherein a route having a relatively small load is selected from a plurality of route candidates with a relatively high probability.

31.   The recording medium according to claim 30, wherein
10 the step (c) comprises the steps of:

checking quality of each of the route candidates by referring to the link state information when receiving a connection setup request; and

selecting the route for a requested connection from
15 the route candidates depending on the quality of each of the route candidates.

32.   The recording medium according to claim 30, further comprising the step of:

d) determining an alternate route when a
20 failure notification is received, wherein a route having a relatively small load is selected as the alternate route from a plurality of route candidates with a relatively high probability.

33.   The recording medium according to claim 32, wherein the step (d) comprises the steps of:

checking quality of each of the route candidates by referring to the link state information when receiving a
5   failure notification message; and

selecting the alternate route for failure recovery from the route candidates depending on the quality of each of the route candidates.